

**Summary of ICCR Source Work Group Meeting  
Houston, Texas  
November 20, 1997  
Stationary Combustion Turbine Work Group**

**I. Purpose**

The main objectives of the meeting were as follows:

- Discuss and assure that the WG understands CC recommendations.
- Discuss and review task group schedules and deliverables.
- Discuss preliminary test plan and agree on steps to take to finalize the plan.
- Discuss and review 1998 WG meeting dates.

**II. Location and Date**

The meeting was organized by the US Environmental Protection Agency (EPA) and was held at the Red Lion Hotel, Houston, Texas. The meeting took place on November 20, 1997.

**III. Attendees**

Meeting attendees included representatives of the OAQPS Emission Standards Division, trade associations, academic and environmental groups, and state agencies. A complete list of attendees, with their affiliations, is included as Attachment I.

**IV. Summary of Meeting**

The meeting consisted of discussions and presentations between WG members and public participants on selected issues which are listed below. The order of the meeting differed somewhat from the agenda provided as Attachment II. A bullet point summary of the meeting is presented as Attachment III.

The topics of discussion, in order of discussion, included the following:

- Outcomes of the CC meeting
- Discussion of the possibility of delisting a subcategory of turbines
- Preliminary test plan
- Pollution Prevention issues
- MACT Floor determination status
- Schedules for 1998 Work Group meetings
- Status of population and emissions databases
- API presentation discussion
- Work Group/Task Group schedules

- Next Meeting

## **Discussion of the Outcomes of the CC Meeting**

The WG reviewed the decisions of the CC meeting and discussed items which need to be developed in response to the CC decisions.

- ICR Survey: The WG discussed follow-up procedures for the 21 facilities which indicated they had HAP test reports for turbines in the ICR survey. It was decided that as a first step, Alpha-Gamma will review the list of respondents which will be provided by ERG to identify facilities which are not already in the emissions database for turbines.
- Pollution Prevention: The CTWG was allotted one membership to the CC Pollution Prevention Subgroup.
- Satisfaction Survey: Sims Roy reviewed with the WG the results of the Satisfaction Survey, which included information pertaining to the EPA co-chair and source WG responsibilities. A handout detailing the results was distributed to WG members. An electronic version of this handout is not available; interested parties may contact Sims Roy for a hard copy of the document. Greg Adams attended the November 3 meeting at which the satisfaction survey was discussed and offered his understanding of the main take-home messages to WG members: 1. Refer back to ICCR document; 2. Co-chairs need to be more forward in moving things along; 3. Non-consensus on an issue is OK; 4. Co-chairs might meet at times other than WG meetings to expedite efficiency.
- Timeline: The WG is responsible for updating the timeline and submitting status reports to the CC. Many WG members expressed concern over the timeline, especially in light of the CC admonishing the RICE WG for not meeting their testing deadlines while they are ahead of all of the WGs in this area.
- CTWG Pollutant List Presentation to the CC: Sims Roy described the process decided upon by the CC for dealing with the CTWG's non-concurrence on the pollutant list for landfill gas. A two-page letter to the EPA will be drafted reflecting the majority and minority opinions on this issue by a six member group comprised of Sims Roy, Ted Guth, Greg Adams, Jim Stumbar, and two other members of the Coordinating Committee to be named by the Environmental Caucus.

## **Discussion of the possibility of delisting a subcategory of turbines**

- Diane McConkey reviewed the possible routes that are acceptable for delisting a subcategory under the Clean Air Act. She indicated that for the case of digester gas-fired turbines, delisting may not be the issue, since right now it looks like the MACT Floor will be no controls, and hence there may be no

reason to subcategorize at the floor level. She recommended that if distinctions are made by fuel types, they could be taken into account when considering regulatory alternatives above the floor.

- Greg Adams indicated an interest in continuing to pursue excluding digester gas-fired turbines altogether from MACT regulation.
- The WG closed the issue by agreeing that the information needed to bear in mind for future conversations had been provided.

#### **Preliminary test plan**

- Sims Roy distributed to WG members a draft of the CTWG Test Plan, which is included as Attachment IV. Discussion of the test plan revealed that many members had concerns and opinions about the content of the test plan.
- It was decided that WG members will make comments on the test plan to Sims Roy by December 12, 1997. WG members agreed to distribute their comments among the group.
- Sims Roy solicited the help of the WG in determining possible testing sites. A concern was raised about the possibility of a test site being out of compliance during testing deterring potential candidates from participating. Diane McConkey was asked to check into the possibility of protections from enforcement for a violation discovered during such testing.

#### **Pollution prevention issues**

- John Shoaff of EPA spoke briefly to the WG about the incorporation of Pollution Prevention(P2)measures into ICCR.
- Valerie Overton reported that the CC is establishing a Pollution Prevention Subgroup which will consider P2 opportunities for all ICCR Source WGs. The CTWG was allotted one member to serve on the CC Subgroup; Chuck Solt was nominated as the CTWG P2 member and Ted Guth was named as the alternate nominee.
- Sims Roy indicated that he would like the CC Subgroup to take the lead on this issue and report back to the CTWG before the WG considers taking a more individual role in Pollution Prevention. Consensus was reached on delaying the formation of a CTWG Pollution Prevention Task Group until the results of the CC Pollution Prevention Subgroup are reported.

#### **MACT Floor determination status**

- Sims Roy is preparing a straw MACT Floor proposal. WG members asked Sims Roy to distribute the straw proposal to all WG members for review. The MACT Floor Task Group will hold a teleconference for discussion in December.

#### **Schedules for 1998 Work Group meetings**

- WG members reached consensus on holding face-to-face meetings the day after CC meetings for the 1998 calendar year.

- Consensus was reached on holding teleconferences from 1-3 pm EST. the third Wednesday of months in which face-to-face meetings are not held for the 1998 calendar year.

### **Status of population and emissions databases**

- Brahim Richani reported that the official version of the emissions database will not be released until March, 1998. Several WG members indicated an interest in reviewing the emissions database sooner; Sims Roy agreed to have Brahim Richani post the current emissions database on the TTN.
- Jeff Willis expressed concern over the GRI data, indicating that he has personal knowledge that a CO emissions data point was an order of magnitude too low.
- Sims Roy agreed to provide the WG with tables of the operating parameters that were identified by WG members as missing in the source test reports and were obtained through phone call inquiries.
- Keri Leach reported that the Rolls Royce data provided by Jeff Willis at the September, 1997 CTWG meeting had been incorporated into the population database. Other database refinement activities reported included the creation of a short list of fields table, updating SCC codes to indicate correct fuel types, and the clarification of California capacity codes. The lack of make and model information for turbines was discussed.

### **API Presentation Discussion**

- Sims Roy observed that the results reported at the API presentation suggest that the WG should test for metals from natural-gas fired turbines.
- Brahim Richani was asked to review the API emission factors for metallic HAPs from natural gas-fired turbines with the gathered test reports from WSPA. Several members expect that the API test reports are the same test reports that the WG has reviewed. Brahim Richani will investigate this matter more fully.
- Consensus was reached among WG members that a critical review of the API presentation was in order. WG members decided to review the API information and provide comments and questions they may have to Sims Roy by December 5, 1997.

### **Work Group/Task Group schedules**

- Sims Roy distributed a memo from the Economic Analysis Work Group detailing information requested from the CTWG. WG members were asked to review the request. Sims Roy stated that the Model Plant Task Group would invite the Economic Analysis Work Group to make a presentation in a subsequent teleconference.
- Sims Roy requested that Task Group leaders review their schedules to see if the goals set forth are attainable. Task

Group leaders were requested to provide modifications to their timelines to Sims Roy by December 19, 1997.

#### **Next Meeting**

- The next WG meeting will be a teleconference on December 10, 1997, from 1 to 3 p.m. EST.
- The potential agenda items include:
  - Report from P2 representative to CC Pollution Prevention Subgroup
  - Economic Analysis Work Group's data request
  - Status of CC letter to EPA about CTWG Pollutant List non-concurrence
  - Discussion of API Source Test Results

The meeting adjourned at 2:30 pm.

These minutes represent an accurate description of matters discussed and conclusions reached and include a copy of all reports received, issued, or approved at the November 20, 1997 meeting of the Stationary Combustion Turbine Work Group.

Sims Roy

ATTACHMENT I  
LIST OF ATTENDEES

**Stationary Combustion Turbine Work Group Meeting**  
**November 20, 1997**  
**List of Attendees**

Sims Roy	EPA OAQPS Emissions Standards Division
Greg Adams	Los Angeles County Sanitation District
Sam Allen	Dow Chemical Company
Gordon Brown	Exxon Chemical Company
Derek Furstenwerth	Houston Lighting and Power Company
Sam Gieryn(telecon)	Wisconsin's Environmental Decade
Ted Guth	Permitting Regulatory Affairs Consultant
Peter Hill	US Naval Facilities Engineering Svc. Center
John Klein	ARCO Alaska, Inc.
Diane McConkey	EPA OMB
Jerry Napierala	Solar Turbines
Valerie Overton	Eastern Research Group
Jeff Willis	Rolls Royce
Stan Coerr	Coerr Environmental
Brahim Richani	Alpha-Gamma Technologies
Keri Leach	Alpha-Gamma Technologies
Chuck Solt	Catalytica
Marc Phillips	INGAA
Jocelyn Siegel	Abt Associates
John Preczewski	New Jersey Dept. Of Environmental Protection
Terry Harrison	EPA
John Shoaff	EPA





**ATTACHMENT II**  
**MEETING AGENDA**

**Tentative Agenda**  
**Stationary Combustion Turbine Work Group**  
**November 20, 1997 Work Group Meeting**  
**Houston, Texas**

- Objectives*
1. *Discuss and assure that the WG understands CC recommendations*
  2. *Discuss and review TG schedules and deliverables*
  3. *Discuss preliminary test plan and agree on steps to take to finalize plan*
  4. *Discuss and agree on 1998 WG meeting dates*
- 8:00            API Presentation to all WGs: Summary of Test Results on HAPs
- 9:00            Open WG Meeting and Review Meeting Agenda/Objectives (S. Roy, V. Overton)
- 9:15            Discuss Issues Raised in Coordinating Committee (S. Roy, T. Guth, G. Adams, V. Overton)  
                  —Outcomes of the WG's presentation  
                  —Outcomes of the November 3 Co-Chairs/Facilitators Meeting  
                  —Other issues/decisions relevant to the WG
- 10:30           BREAK
- 10:45           Discuss Possibility of Delisting a Subcategory of Turbines (D. McConkey)
- 11:00           Discuss Preliminary Test Plan (S. Roy)  
                  —Preliminary draft of plan  
                  —Issues to be resolved to revise/finalize test plan  
                      \*Number of turbines to test  
                      \*Technology to test  
                      \*Fuels to test  
                      \*Process parameters to document during testing  
                      \*Operating loads to test
- 12:30           LUNCH
- 1:30            Discuss Status of Work on MACT Floors (S. Roy)  
                  —MACT floor for existing sources  
                  —Discuss plan for developing MACT floor for new sources
- 2:00            Discuss WG/TG Schedules (TG leaders)  
                  —TG leaders discuss schedules and deliverables  
                  —Conformance of TG schedules with overall schedule  
                  —Concurrence on schedules
- 3:15            Plan Dates for 1998 WG Meetings and Teleconferences (S. Roy, V. Overton)

- 3:45      Initiate Discussion of Pollution Prevention Issues (S. Roy, S. Gieryn)  
            —Results of S. Gieryn's survey  
            —Initial ideas for pollution prevention opportunities in turbine settings  
            —Discuss inclusion of P2 in agenda for February 1998 meeting
- 4:15      Discuss Population and Emissions Databases (B. Richani, G. Adams)  
            —Status of population database  
            —Status of emissions database (additions from landfill gas and process gas sources)  
            —Release of new version of database
- 4:45      Closing Business  
            —Discuss agenda for December WG Teleconference (S. Roy, V. Overton)  
            —Review flash minutes (B. Richani)  
            —Discuss whether meeting objectives were met (WG members)
- 5:00      ADJOURN

**ATTACHMENT III**

**BULLET POINT SUMMARY**

**Summary of ICCR Source Work Group Meeting  
Combustion Turbines Work Group Meeting  
Red Lion Hotel, Durham, NC - November 20, 1997**

**Decisions**

- C. Solt agreed to serve as the CTWG's representative to the CC's Pollution Prevention (P2) Subgroup. T. Guth was named as the alternate candidate.
- Consensus was reached on delaying the formation of a P2 Task Group until the results of the CC P2 Subgroup are reported.
- Consensus was reached on holding face-to-face CTWG meetings the day after CC meetings for the 1998 calendar year.
- Consensus was reached on scheduling teleconferences the third Wednesday of each month in which a face-to-face meeting is not held from 1-3 pm EST for the 1998 calendar year.
- J. Klein and G. Adams were added to the Model Plant Task Group.
- J. Klein and M. Phillips were added to the MACT Floor Task Group.
- J. Napierala was added to the Testing and Monitoring Task Group.

**Next Meeting**

- The next Combustion Turbine Work Group Meeting will be a teleconference on December 10, 1997, from 1:00 - 3:00 pm, EST. The call in number is 919-541-4332.
- Items to be discussed at the next meeting may include:
  - Report from the CTWG representative to the CC P2 Subgroup
  - The Economic Work Group memo
  - Status of the majority/minority pollutant list letter to EPA
  - Compilation of the API comments

**Action Items**

- S. Roy, T. Guth, G. Adams, and three other members of the CC will draft a 2-page letter to EPA summarizing the landfill gas pollutant list non-concurrence issue.
- Comments on the test plan will be sent to S. Roy by December 12, 1997. Each WG member will circulate comments to all other WG members.
- WG members will investigate potential testing sites and will send any possibilities to S. Roy by December 10, 1997.
- B. Richani will review the API emission factors for metallic HAPs from natural gas-fired turbines with the gathered test reports from WSPA.
- B. Richani will review the list of test reports which will be provided by ERG to identify reports which are not in the emissions database for turbines.
- WG will review the API data summary documents presented before the CTWG meeting and will send comments and questions for API to S. Roy by December 5, 1997.
- Alpha-Gamma will forward the task group summary document to WG members.
- Task group leaders will make revisions and comments to their milestone tracking schedule. These revisions will be submitted to S. Roy by December 19, 1997.
- S. Roy will check with T. Harrison regarding the TMPWG's minimum detection limits protocol.
- Alpha-Gamma will post the revised emissions database on the TTN.
- D. McConkey will check on the possibility of an exclusion from compliance provision for testing.
- S. Roy will distribute a straw MACT floor proposal to the entire WG; a teleconference for the MACT Floor Task Group will be scheduled subsequently for discussion.

- B. Richani will provide the WG a table of the operating parameters that were obtained for the test reports classified by WG members as “incomplete” reports. These parameters were obtained by contacting the sites where these tests were conducted.

**Facilitator’s Objectives Summary  
Stationary Combustion Turbine Work Group  
November 20, 1997 Work Group Meeting, Houston**

The Stationary Combustion Turbines Work Group met in Houston, TX, on Thursday, November 20, 1997. The stated objectives of the meeting were to:

- Discuss and assure that the WG understands CC recommendations
- Discuss and review TG schedules and deliverables
- Discuss preliminary test plan and agree on steps to take to finalize plan
- Discuss and agree on 1998 WG meeting dates

These objectives were largely fulfilled. Specifically:

- Sims Roy gave a presentation on the Satisfaction Survey and the directions and conclusions that emerged from the results of that survey, as discussed in the Coordinating Committee. WG members discussed this information and indicated that they understand the CC’s recommendations.
- The WG discussed the need to review the schedule and milestone tracking sheet prepared by the Planning Task Group for the February CC meeting, the goal being to flesh out and update the schedule/tracking sheet to ensure it accurately reflects the anticipated activities of the TGs and that these activities are timed in a manner consistent with the overall work group/ICCR schedule. WG members agreed on a process and timeframe for doing this, and agreed to identify possible scheduling problems and remedies.
- Sims Roy presented the Testing Task Group’s preliminary test plan, and WG members offered preliminary comments on the test plan. The WG agreed on a process for reviewing and revising the test plan as needed.
- The WG agreed on dates for 1998 work group meetings and teleconferences.

The WG discussed other topics as well, which contributed to furthering progress on the short- and long-term tasks.

**ATTACHMENT IV**  
**PRELIMINARY TEST PLAN**

# Combustion Turbines Emissions Testing Protocol

DRAFT - 11/13/97

## **INTRODUCTION**

The Combustion Turbine Work Group (CTWG) was created as a part of the Internal Combustion Coordinated Rulemaking (ICCR) effort for promulgating a unified set of air emissions regulations for stationary combustion sources. The Work Group's responsibility is to provide recommendations focused on the regulation of stationary gas turbines to the ICCR Coordinating Committee (CC). As part of this effort, the Testing and Monitoring Task Group within the CTWG is responsible for developing a testing protocol for hazardous air pollutants (HAPs) emission determination and control device efficiency evaluation. The Task Group recommends that turbines representing the newest control technologies in the industry be tested in order to fill identified data gaps by providing emissions data under known operating conditions. No data are available for add-on controls. This information is necessary to determine the MACT Floor and above the floor options for new sources and existing sources. The specific pollutants to be tested have been determined by the Task Group for each fuel type. Sampling will take place before and after add-on air pollution control equipment to determine the effectiveness of the device in controlling the emission of HAPs. Some selected criteria pollutants emissions will be measured simultaneously with the HAP emissions during testing in an effort to examine possible relationships between these pollutants so they can be used as HAP surrogates to reduce compliance costs. The overall goal of the testing program is to assist the Combustion Turbines Work Group in making its recommendations to the CC by providing a more complete set of emissions data to review.

## **SOURCE DESCRIPTION**

### *Process Description*

The Task Group recommends testing four turbines: three natural gas-fired turbines and one #2 fuel oil-fired turbine. Natural gas and #2 fuel oil-fired turbines were selected since they represent the fuel used by the vast majority of turbines operating and being installed in the United States. The



Task Group recommends testing each turbine at four different load conditions in order to determine the effect of load variation on HAP emissions. The recommended loads to be tested are 25, 50, 75, and 100 percent of peak load (or at four points in the normal operating range of the turbine, including the maximum and minimum load conditions).

Turbines with dry low NO<sub>x</sub> (DLN) combustion systems which are also equipped with CO oxidation catalysts will be sought for the natural gas-fired turbine tests. Units equipped in this manner are desired so that the ability of each technology to reduce HAP emissions can be tested on the same unit. DLN combustion systems were selected because they represent the latest technology in the industry and represents the vast majority of new sources. In addition, DLN systems emit low levels of CO which may reflect low HAP emissions. CO oxidation catalysts were selected since there is a strong perception that these catalysts will also reduce HAP emissions. Empirical data are required to confirm and evaluate their efficiency for the destruction of HAPs.

If DLN units with CO catalysts are not available for testing, the Task Group recommends testing one DLN turbine with no add-on controls and two turbines equipped with a CO catalyst.

For the #2 fuel oil-fired turbine, the Task Group recommends testing a turbine with a CO oxidation catalyst. A cogenerative cycle turbine coupled to a duct burner may be recommended as a fifth turbine to be tested.

A summary of the recommended key turbine parameters to be documented in this testing program are presented in Table 1.

The specific pollutants to be measured by fuel type are presented in Table 2. Emission stream measurements will be conducted at sampling points before and after the add-on control device (when applicable) for all tests. Pollutants indicated by an \* in Table 2 will be measured using fuel sampling at an appropriate point in the process stream.

#### *Test Matrix*

Table 3 provides the test matrix for the CTWG proposed tests. This information will be

monitored and recorded during testing on all units.

## **SAMPLING LOCATIONS**

### *Exhaust Gas Sampling*

Sampling locations will be determined according to EPA Method 1. The testing contractor will be expected to select exact locations in accordance to Method 1 requirements. The testing contractor will also provide general schematics of the sampling locations as well as explanations of any special traversing or measurements schemes.

### *Fuel Sampling*

The testing contractor will be expected to provide a general schematic of fuel sampling locations and a discussion of the representativeness of each of the process stream sampling points.

## **SAMPLING AND ANALYTICAL METHODS**

Sampling and analytical methods will be decided upon by the Testing and Monitoring Protocol Work Group (TMPWG). The CTWG provided the TMPWG with a list of applicable test methods determined from the gathered test reports for gas turbines. These methods are represented in Table 2.

## **COST AND SCHEDULE**

Cost estimates to conduct the Combustion Turbines Test Plan will be provided by the TMPWG. The schedule for testing and for submitting final test reports will then be determined based on the information provided by the TMPWG.

Table 1. General Information

		Test 1	Test 2	Test 3	Test 4
Facility Information	Name				
	Address				
	Technical Contact				
	Phone Number				
Gas Turbine Information	Make				
	Model				
	Combustion Technology				
	Typical Rating (MW)				
	Operating Cycle				
	Equipped with CEMs?				
Fuel Information	Fuel Type				
	Fuel Composition				
	Fuel Heating Value (BTU/dscf or BTU/gal)				
	Fuel Flow Rate (BTU/hr)				
Control Device Information	Control Device Type				
	Other equipment (duct burners, etc)				

Table 2. Pollutants to be Measured

Pollutant	Test Method	Natural Gas	#2 Fuel Oil
<i>Hazardous Air Pollutants (HAPs)</i>			
2,2,4-Trimethylpentane	Method 18/TO-14	X	X
Acetaldehyde	FTIR	X	X
Acrolein	FTIR	X	X
Arsenic Compounds*	Fuel Analysis	X	X
Benzene	Method 18/TO-14	X	X
Beryllium Compounds*	Fuel Analysis		X
Biphenyl	CARB 429 and 429 (m)	X	X
Cadmium Compounds*	Fuel Analysis		X
Chromium Compounds*	Fuel Analysis		X
Ethylbenzene	Method 18/TO-14	X	X
Formaldehyde	FTIR	X	X
Hexane	Method 18/TO-14	X	X
Lead Compounds*	Fuel Analysis		X
Manganese Compounds*	Fuel Analysis		X
Mercury Compounds*	Fuel Analysis	X	X
Methanol	Method 18/TO-14	X	X
Naphthalene	CARB 429 and 429 (m)	X	X
Nickel Compounds*	Fuel Analysis		X
PAH	CARB 429 and 429 (m)	X	X
Phenol	CARB 429 and 429 (m)	X	X
Styrene	Method 18/TO-14	X	X
Toluene	Method 18/TO-14	X	X
Xylene (o, m, & p)	Method 18/TO-14	X	X
<i>Criteria Pollutants</i>			
Carbon monoxide (CO)	FTIR	X	X
Oxides of nitrogen (NOx)	FTIR	X	X
Particulate Matter (PM)	Method 5		X

Total Hydrocarbons (THC)	Method 25A	X	X
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TABLE 3. Test Matrix - Sample for Natural Gas

Turbine Make & Model:  
Combustion Technology: Dry Low NOx  
Fuel Type: Natural Gas  
Control Device: CO Oxidation Catalyst  
Pollutants to be Measured: 2,2,4-Trimethylpentane, Acetaldehyde, Acrolein, Arsenic Compounds\*, Benzene, Biphenyl, Ethylbenzene, Formaldehyde, Hexane, Mercury Compounds\*, Methanol, Naphthalene, PAH, Phenol, Styrene, Toluene, Xylene, Carbon Monoxide (CO), oxides of nitrogen (NOx), and total hydrocarbons (THC)  
Test Methods: Method 18/TO-14 (2,2,4-Trimethylpentane, Benzene, Toluene, Ethylbenzene, Xylenes, Hexane, Styrene); FTIR (Formaldehyde, Acetaldehyde, Acrolein, NOx, CO); CARB 429 and 429(m) (Biphenyl, Naphthalene, PAH, Phenol); Method 25A (THC); Method 5 (PM); Fuel Testing for metals  
Sampling Locations: Before and after the catalyst  
Sample run time: 30 minutes, at a minimum

Run #:	1	2	3	4	5	6	7	8	9	10	11	12
Operating Conditions												
Load	25	25	25	50	50	50	75	75	75	100	100	100
Compressor Discharge Pressure (psig)												
Firing Temp (F)												
Turbine Inlet Temp (F)												
Fuel Firing Rate (BTU/h)												
Control Device												
Control Device Type (or other add-on device)												
Inlet Temperature (F)												
Volume (scft)												
Exhaust Gas Info.												
Exhaust Gas Volumetric Flow Rate (scfm)												
Exhaust Gas Temp (F)												
Moisture content (%)												
Oxygen or CO <sub>2</sub> content												
Ambient Conditions												
Temperature (F)												
Relative Humidity (%)												
Barometric Pressure (psig)												
Altitude												

**ATTACHMENT V**

**ECONOMIC ANALYSIS WORK GROUP DATA REQUEST**

## Economic Analysis Work Group Data Development and Analysis Schedule

At the September Coordinating Committee (CC) meetings in Durham, the CC asked the work groups to review the draft regulatory development schedule (Table 4, Industrial ICCR Organizational Structure and Processes, June 1997, Revision 2) and provide the CC with an outline of how each work group proposes to meet their schedule. Included should be specific activities/deliverables required from other work groups and any issues that need to be discussed or approved by the CC.

To meet this schedule, the Economic Analysis Work Group (Econ WG) proposes the timeline provided in Table 1. The activities in italics are from the draft regulatory development schedule and thus are the basis from which the proposed schedule was developed.

TABLE 1. TIMELINE

Description of Activity or Deliverable	Date
Representative from Econ WG attends (sit at table) of each Source Work Group's meeting at the November meetings in Houston to discuss data requests for economic and benefits analysis	November 20, 1997
Source Work Groups provide preliminary data on population and costs (see attachment for list of information included)	January 1998
Econ WG reviews data available for analysis and selects appropriate methodology for economic and benefits analysis	January - February 1998
Econ WG provides Source Work Groups with comments and suggestions for final data request	February 1998
Econ WG presents analysis plan at the March CC Meetings	March 1998
Econ WG receives final data from Source Work Groups to support economic and benefits analysis	March 1998
<i>Econ WG performs overall economic impact and benefits analysis, considering interactions among source categories</i>	<i>April - August 1998</i>
<i>Econ WG presents preliminary results of economic and benefits analysis to the CC and Source Work Groups</i>	<i>August 1998</i>
Econ WG addresses comments and develops final results	October 1998

## ATTACHMENT

### Contents of Preliminary Data Requests Source Work Group Information to Support Economic Analysis

From each Source Work Group, the Economic Analysis Work Group (Econ WG) is requesting the information listed below to support the economic and benefits analysis. Prior to finalizing the economic and benefits analysis methodology, the Econ WG needs to assess the information available for the analysis. To this end, the Econ WG is making a preliminary data request for information available by the end of January 1998. If data development is not complete by the end of January for all subcategories or fuel types, please provide sufficient detail to determine the data structure and assess the comprehensiveness of the final information that will be provided at the end of March 1998.

The requested information described below is premised on the assumption that data are being developed on a “model plant” basis. Please keep in mind that the Econ WG will need to link cost and emissions data back to the ICCR population database to integrate the data with information from the other Source Work Groups. In addition, the information below represents “typical” data needed for the economic and benefits analysis. However, some processes or regulatory alternatives will likely require additional information.

The requested information is segmented into two categories that reflect both the relative importance of the information in the economic analysis and the Econ WG’s ability to obtain the information from alternative sources. Table 1 provides details on the must have data, and Table 2 lists information needed for the analysis.

**Must Have Data**—This information must be developed by the Source Work Groups to support the economic analysis.

**Data Needed for Analysis**—This information is needed for the economic analysis, but assumptions or alternative sources could be developed by the Econ WG. However, the timeliness and quality of the economic analysis would be enhanced if this information is readily available or could be developed at low cost by the Source Work Groups.



TABLE 1. MUST HAVE DATA

Data Type	Description	Units
Regulatory Alternative	Several regulatory alternatives may be developed that vary in the stringency of emissions reductions.	Cost and emissions data are needed for each regulatory alternative
Capital Costs		Annualized \$/plant
• Fixed	<i>Fixed capital costs</i> do not vary with emissions levels. May include capital expenditures, overhead allocations, property taxes, insurance, administrative fees, etc.	
• Variable	<i>Variable capital costs</i> vary with emission. May include reduction in life expectancy of equipment.	
O&M Costs		\$/year/plant
• Fixed	<i>Fixed O&amp;M costs</i> do not vary with emissions levels. May include routine maintenance and labor, inspections, etc.	
• Variable	<i>Variable O&amp;M costs</i> vary with emissions. May include maintenance and labor associated with level of usage, energy/utilities, waste treatment disposal, raw materials, etc.	
Emissions Impacts	Emissions reductions associated with each model plant, including speciation of emissions.	Tons/year and/or tons/time period
Emissions Baseline	Baseline emissions are also needed because in many cases health benefits depend on the initial level of emissions (as well as the change), and/or the formation of secondary pollutants may not be a linear relationship.	Tons/year and/or tons/time period
Population and Distribution	Costs and emissions data for model plants need to be weighted to estimate market impacts. In addition, the distribution of costs across plant size and markets is important. For example, impacts on small businesses and government entities need to be identifiable.	Weights for model plants and links to ICCR population database

(continued)

TABLE 1. MUST HAVE DATA (CONTINUED)

Data Type	Description	Units
Description of Model Plant and Processes	For example, is waste heat used productively and is this affected by regulatory alternatives?	
Costs for New Sources	If costs or emissions reductions for new sources are different from existing sources, new source model plants are typically needed.	
Engineering Parameters	For an agreed upon subset of model plants (to be negotiated as the process evolves) or pollutants (such as HAPs), engineering parameters are needed to assess benefits, such as stack height and flow rates.	

TABLE 2. DATA NEEDED FOR ANALYSIS

Data Type	Description	Units
Baseline	The baseline is used for comparing economic impacts of regulatory alternatives. It should reflect the state of affected industries (in the absence of ICCR regulations) at the anticipated time of implementing the regulation. In particular, changes in the ICCR population database that have occurred or are likely to occur in the near future need to be included in the baseline.	Historically, 5 years has been used as the projected time for implementing the regulation.
Parent Company Name and Employment	Used for SEBREFA, Unfunded Mandates, etc.	
Sales of Parent Company	Used for SEBREFA, Unfunded Mandates, etc.	
Production Level	Number of units produced at the facility	
Type of Production	Whether the products are intermediate or final products, and if they are typically used in-house or sold in markets.	